3 Alternatives

3.0 ALTERNATIVES

3.1 SELECTION OF ALTERNATIVES

According to the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), governmental decision-makers must consider reasonable alternatives to a proposed action that could result in significant environmental effects. To be reasonable, the alternatives must:

- Satisfy most of a project's basic objectives;
- Avoid or substantially lessen any of a project's significant effects; and
- Be feasible.

This Environmental Impact Statement/Environmental Impact Report (EIS/EIR) presents a reasonable range of alternatives in accordance with NEPA and the CEQA. As set forth by NEPA and the CEQA, the EIS/EIR does not consider every possible alternative. Discussion focuses on alternatives that could substantially avoid or lessen significant Project effects, even if these alternatives to some degree would impede the attainment of Project objectives or be more costly. The selected range of alternatives is intended to facilitate meaningful discussion among decision-makers and the public.

In addition, this EIS/EIR considers a no-action (or no-Project) alternative.

The analysis of alternatives follows a three-step process:

- Potential alternatives are identified;
- The potential alternatives are screened to determine those that are reasonable. Reasons for eliminating potential alternatives from further consideration are briefly explained; and
- The potential alternatives that are not eliminated are evaluated for environmental effects, similar to the manner in which the proposed Project's effects are evaluated.

3.2 IDENTIFICATION OF A REASONABLE RANGE OF ALTERNATIVES

Potential Alternatives

The first step in the analysis of alternatives is to identify potential alternatives. The public and agencies provided a number of scoping comments regarding alternatives. Several comments noted that alternative methods of supplies of natural gas (including pipelines), energy conservation, and use of and research into renewable sources of energy (such as solar power) should be considered. Other commentors identified potential alternative sites for the floating storage and regasification unit (FSRU) and offshore pipelines such as the following: farther from the Channel Islands National Marine Sanctuary (CINMS) and other ecologically sensitive areas; somewhere west of

the Channel Islands; and offshore of Camp Pendleton or Vandenberg Air Force Base/Point Conception.

Still other commentors requested that the onshore pipeline routes avoid Ormond Beach and other wetland restoration sites; provide a more direct entry to the natural gas pipeline network; or be relocated to rural, unpopulated areas away from colleges, schools, senior housing, hospitals, detention centers, and seismic hazards. These comments were used to help define the potential alternatives, as described below. In addition, in response to scoping comments, the Applicant revised the proposed Project and developed additional alternative onshore pipeline routes. The Project team evaluated and further modified the alternative pipeline routes.

Other proposed or potential liquefied natural gas (LNG) terminal projects in Ventura and Los Angeles Counties—Crystal Energy and the Port of Long Beach Sound Energy Solutions—are evaluated in Section 4.20, "Cumulative Impact Analysis."

Potential alternatives discussed in this section include alternative locations, alternative terminal design concepts, alternative technologies for storing and regasifying LNG, and alternative pipeline routing and installation (see Table 3.2.1-1).

3.3 POTENTIAL ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS AS NOT REASONABLE

To warrant detailed evaluation by the U.S. Coast Guard (USCG), the U.S. Maritime Administration (MARAD), and the California State Lands Commission (CSLC), an alternative must be reasonable (see Section 3.1, "Selection of Alternatives"). Several potential alternatives to the proposed Project have been identified. The following subsections identify the alternatives that were determined to be not reasonable and the basis for those determinations. These alternatives are not evaluated in detail in this EIS/EIR. Alternatives carried forward for analysis in this EIS/EIR are identified in Section 3.4, "Alternatives Evaluated in the Environmental Impact Statement/ Environmental Impact Report."

3.3.1 Energy Conservation

Energy conservation measures were considered but not carried forward as an alternative in this EIS/EIR because they are ongoing activities that would occur whether or not the proposed Project is approved. The State of California is actively working to decrease its per capita use of electricity through increased energy conservation and efficiency measures. Energy conservation measures include actions such as improving new and remodeled building efficiency, improving air conditioner efficiency and appliances, and creating customer incentives to reduce energy demand.

Table 3.2.1-1 Categories of Potential Alternatives Considered

Alternative Concept	Options/Locations (Section)		Project	Alternatives Carried Forward	
No Action/No Project	No Action Alternative (3.4.1)			YES	
Other "Sources"	Energy Conservation (3.3.1)				NO
	Renewable Energy (3.3.2)				NO
	New or Expanded Pipeline Systems (3.3.4)				NO
Terminal Locations	Regional locations (3.3.5)	Baja California, Mexico (3.3.3)			NO
		Southern Washington/Northern Oregon (3.3.5.1)			NO
		Southern Oregon/Northern California (3.3.5.2)			NO
		Central California (3.3.5.3)			NO
		Southern California/Northern Mexico (3.3.5.5)			NO
	Onshore California (3.3.6.1)	Camp Pendleton			NO
		Deer Canyon			NO
		Rattlesnake Canyon			NO
	Offshore California (3.3.6.2)	Cabrillo Port site	YES		
		Santa Barbara Channel (Ventura Flats) including offshore pipeline via Platform Grace, Reliant Energy Mandalay Generating Station Shore Crossing, and Gonzales Road Pipeline		YES	
		Anacapa Island			NO
		Chinese Harbor			NO
		Smugglers Cove			NO
		Deer Canyon			NO
		San Pedro Point			NO
		Bechers Bay			NO
		West side of Channel Islands			NO
		Camp Pendleton			NO
Deep Water Port Concepts	Floating terminal	Floating storage and regasification unit (FSRU) (2.3.1)	YES		
		Single Point Mooring Direct Regasification (e.g., Energy Bridge)			NO
	Fixed terminal	Gravity-based structure (3.3.7.2)			NO
		Platform (3.3.7.1)			NO

Table 3.2.1-1 Categories of Potential Alternatives Considered

Alternative Concept	Options/Locations (Section)		Project	Alternatives Carried Forward	
Storage Tank Designs	Moss (2.3.1.2)		YES		
	Membrane (3.3.9)				NO
Regasification Methods	Open-rack vaporizer (3.3.8)				NO
	Intermediate fluid vaporizer (3.3.8)				NO
	Submerged combustion vaporizer (2.3.1.2)		YES		
Pipeline Routes	Offshore pipeline route	Project offshore pipeline route (2.3.2)	YES		
		Offshore Pipeline Route 1 (3.3.12.1)			NO
		Offshore Pipeline Route 2 (3.3.12.2)			NO
		Offshore Pipeline Route 3 (3.3.12.3)			NO
	Shoreline crossing/ pipeline	Reliant Energy Ormond Beach Generating Station Shore Crossing (2.3.2)	YES		
		Arnold Road Shore Crossing/Arnold Road Pipeline (3.4.4.1)		YES	
		Point Mugu Shore Crossing/Casper Road Pipeline (3.4.4.2)		YES	
		Reliant Energy Mandalay Generating Station Shore Crossing (3.4.2)		YES	
	Center Road onshore pipeline route	Center Road Pipeline (2.3.4.1)	YES		
		Center Road Pipeline Alternative 1 (3.4.5.1)		YES	
		Center Road Pipeline Alternative 2 (3.4.5.2)		YES	
	Line 225 Pipeline Loop onshore route	Line 225 Pipeline Loop (2.3.4.2)	YES		
		Line 225 Pipeline Loop Alternative 1 (3.4.5.2)		YES	
Shoreline Crossing Pipeline Installation Methods	Horizontal directional drilling	Ormond Beach, Mandalay Beach (2.4.3)	YES		
	Trenching	Ormond Beach, Mandalay Beach (3.3.10)			NO

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Energy conservation is one of the six critical actions identified in the State of California's May 8, 2003 Energy Action Plan to eliminate energy outages and excessive price spikes in electricity or natural gas (State of California Consumer Power and Conservation Financing Authority, Energy Resources Conservation and Development Commission, Public Utilities Commission. 2003). In addition, the California Public Utilities Commission (CPUC) has established an ongoing Rulemaking R.01-08-028 "Order Instituting Rulemaking (OIR) to Examine the Commission's Future Energy Efficiency Policies, Administration and Programs."

A CPUC Decision D.04-09-060 entitled "Interim Opinion: Energy Savings Goals for Program Year 2006 and Beyond" defines and establishes an energy efficiency program with policies and goals for electricity and natural gas savings with planned updates of these goals every three years. It also translates the Energy Action Plan's mandates into explicit, numerical electricity and natural gas savings goals for the four largest investor-owned utilities.

However, the State's 2003 Energy Action Plan also acknowledges the need to ensure a reliable supply of reasonably priced natural gas. Even taking into account increased conservation measures, natural gas demand is expected to increase by about 1 percent annually, rising about 9 percent over the decade, according to the California Energy Commission (CEC) 2003 Natural Gas Market Assessment (Ghopal CEC 2003, CEC 2003a).

Measures to improve energy conservation address long-term energy policy and usage considerations. Therefore, even if such measures were implemented, they would not be responsive to the short-term and mid-term natural gas supply needs that are intended to be addressed by the purpose and objective of the proposed Project (see Section 1.2 "Project Purpose, Need, and Objectives").

Another reason that energy conservation is not carried forward as an alternative is that the USCG, MARAD, and the CSLC are acting solely as permitting agencies for a project proposed by a private applicant. These agencies do not have authority to initiate or implement broad-based, long-term energy conservation policy measures. They also do not have control over whether such measures will be proposed, approved, and implemented, or over the timeframe in which these actions might occur.

In sum, even if the State were able to implement additional energy conservation measures above and beyond its already aggressive goals, because these measures are not within the control of the USCG, the CSLC and MARAD and because such measures would not address the short and mid-term supply of natural gas which is the objective of the proposed Project, it is not a reasonable alternative and is not carried forward. Energy conservation is considered to be part of the baseline conditions for the proposed Project and is further discussed in Section 4.10, "Energy and Minerals."

3.3.2 Renewable Energy Sources

Similar to energy conservation, renewable energy is not carried forward as an alternative to the proposed Project because it would occur whether the proposed Project is implemented or not. Renewable sources include wind, geothermal, hydropower, and others. The State of California already has legislated aggressive programs to increase the quantity of electricity generated from renewable energy sources to 20 percent from the current 12 percent by 2017. State agencies have proposed to accelerate reaching the renewable goals by 2010, according to the CEC's March 2004 Public Interest Energy Research 2003 Annual Report.

The CEC's 2003 Integrated Energy Policy Report also recommends that the State diversify the electricity system with renewables, partly in response to growing natural gas dependence. However, the report also acknowledges that developing non-traditional natural gas supply sources also is of paramount importance. Similar to energy conservation, CEC projections of future demand incorporate the growing use of renewable sources and still maintain that the need for natural gas will increase.

Additionally, in the context of the proposed Project, the USCG, MARAD, and the CSLC are acting solely as permitting agencies for a project proposed by a private applicant. The USCG, MARAD, and CSLC have no authority to initiate or implement new broad-based policies to promote the expanded use of renewable energy resources beyond that already anticipated under the State's existing aggressive program. Therefore, these agencies have no control over whether such additional renewable programs will be proposed by other private parties or public agencies, approved, and implemented, or over the timeframe in which these activities might occur.

Measures to improve renewable energy address long-term energy policy and usage considerations. Therefore, even if such measures were implemented, they would not be responsive to the short-term and mid-term natural gas supply needs that are intended to be addressed by the purpose and objective of the proposed Project (see Section 1.2, "Project Purpose, Need, and Objectives").

Because increased use of energy from renewable sources would occur with or without the proposed Project, because use of additional renewable sources beyond the State's existing mandates are not within the control of the USCG, MARAD, and the CSLC, and because such measures would not address the short and mid-term supply of natural gas which is the objective of the proposed Project, it is not a reasonable alternative and was not carried forward. Renewable energy sources are considered as part of the environmental baseline conditions of energy supply and are discussed further in Section 4.10, "Energy and Minerals."

3.3.3 Northern Baja Mexico LNG Terminals

This potential alternative was eliminated from further analysis because of growing demand for natural gas within Mexico and the infeasibility (in terms of accomplishing the purpose and objectives of the proposed Project in a reasonable period of time, or even at all) of a location that is in another sovereign nation and is, therefore, outside the legal powers and jurisdiction of the CSLC, the State of California, the Department of Homeland Security, and the United States (U.S.).

Six LNG terminals are or have recently been proposed for Baja California. A Shell/Sempra joint venture has received Mexican permits to build an LNG terminal in Baja California at Costa Azul, 14 miles (22.5 kilometers [km]) north of Ensenada. Other LNG terminals have been proposed: near the Coronado Islands, proposed by ChevronTexaco; near Tijuana, proposed by Marathon Oil (but now cancelled); and two at Lazaro Cardenas, proposed by Tractebel and Repsol, respectively (Bremer February 20, 2004). ConocoPhillips and El Paso had proposed another, but Mexico's National Environmental Agency denied the environmental permit for their terminal. No projects are currently proposed in Rosarito, but it is also a site for potential future development.

The CPUC authorized Sempra Energy and Royal Dutch/Shell Group to create a border point where natural gas converted from LNG could move from Mexican to U.S. pipelines (Los Angeles Times September 3, 2004). Although this action opens up the possibility of importation of natural gas from Mexico, the Shell/Sempra LNG terminal currently has more than 10 legal challenges in Mexican courts and thus its future is not predictable. This project and similar projects have numerous legal challenges.

Furthermore, should a Baja project be approved, growing demand in Baja California for natural gas would mean a shrinking share of imported LNG for California, which would not meet the proposed Project's objectives to provide California with a secure supply. If one or more of these proposed LNG terminals were brought on-line, the gas demand in Baja California (a region with 15 million people) would likely absorb a significant part of the imported supplies. In a press release announcing the project, Sempra stated that, "about half the natural gas from the [Shell-Sempra] terminal will be used to meet the growing energy demands in western Mexico and the rest will be used to supply the southwestern U.S." (Sempra Energy 2003) Similarly, ChevronTexaco includes its proposed terminal as one of several that will serve U.S. West Coast and Mexican markets (Persily 2004). Also, the CEC estimates that demand for natural gas in Baja will grow by 7.6 percent per year (Parkhurst 2002).

In addition, because a Baja terminal would be located in Mexico's territorial waters, neither MARAD nor the CSLC would have jurisdiction to license facilities. Also, natural gas would not be transported from the outer continental shelf to the United States, so MARAD again would not have jurisdiction. Therefore, the United States would not have control over the distribution or the quality of the LNG.

A Baja California LNG terminal also would not reduce environmental effects because many of the offshore effects would be equivalent to those that would occur in California

waters. Onshore, the effects could be greater than those of the proposed Project, especially because an LNG terminal would constitute part of a greater infrastructure development plan, including new power plants fueled by the imported natural gas (Sempra Energy 2004). In addition, to export gas to California from a Baja terminal, new pipelines would have to be built if the capacity were insufficient to accommodate the volume of natural gas. These additional components could have adverse environmental effects.

For all of these reasons, this potential alternative was eliminated because it would neither accomplish most of the purposes and objectives of the proposed Project to provide a large, secure supply of natural gas to the Southern California market nor result in reduced environmental effects relative to those effects identified for the proposed Project. In addition, the permitting, environmental review, and any ultimate approval of an LNG storage and regasification facility in Baja would be outside the legal jurisdiction of the CSLC, the State of California, the Department of Homeland Security, and the United States and would be subject solely to federal and regional Mexican law. Specifically, the selection by the lead agencies of an alternative Project location in Mexico, should this EIS/EIR propose such a location, would have no legal effect because no agency in the United States would have any authority over any project in Mexico. Additionally, any proposal to site the Applicant's proposed LNG facility in Baja would require the Applicant to redirect the application process and plan for or acquire the ancillary onshore infrastructure; this would significantly delay the time when the objectives of the proposed facility could be realized. In light of these legal and economic considerations, it was determined that a Northern Baja site was not a reasonable alternative as defined in NEPA and the CEQA and that further analysis was therefore inappropriate and unwarranted.

3.3.4 New or Expanded Pipeline Systems

New or expanded pipeline systems would not meet the Project objective of increasing the diversity of natural gas supplies to California. In addition, construction of new or expanded pipeline systems would have environmental consequences along whatever corridors were proposed. Therefore, new or expanded pipeline systems were not considered as alternatives to the proposed Project.

California receives approximately 85 percent of its natural gas supply from other states via gas transmission pipelines, and the amount is projected to rise to 88 percent by 2013 (Marks 2004). In-state supplies are limited and the supplies are allocated. Of the 989 million cubic feet per day (MMcfd) produced in California in 1999, only 48 percent was delivered by natural gas utilities. The remainder was either consumed at or near the point of production or delivered for use by a nonutility pipeline network (Gopal 2000). In addition, within California an expansion of the existing intrastate network is unlikely because supplies in these fields are diminishing. Expansion of the interstate pipeline network would temporarily increase the delivered volumes of gas to the State, but it would not increase the diversity of the natural gas supply.

Construction of a new gas pipeline most likely would involve disruptive activities through the desert. The Kern River 2003 Expansion Project EIS/EIR (State Clearinghouse Number 2001071035 [Federal Energy Regulatory Commission and California State Lands Commission February 2003]) states that construction would cause long-term consequences for vegetation and wildlife habitat, which would be removed during construction, as well as potential impacts on threatened and endangered species endemic to the desert, such as the desert tortoise. Although construction of a new pipeline would increase supply and potentially add to the supply from the Rocky Mountains, depending on the source of the natural gas, it would shift the environmental impacts from one project to another.

Therefore, this potential alternative was eliminated because it would shift, not reduce, any adverse environmental effects of the Project and because it would not meet the Project objective of increasing the diversity of the supply of natural gas.

3.3.5 Regional Offshore Alternatives

Other potential alternative locations for the offshore LNG terminal along the West Coast were identified by the Applicant without specifying exact locations within those regions. The following subsections evaluate these regional alternative locations.

3.3.5.1 Washington/Northern Oregon Region

An area near the mouth of the Columbia River, along the Washington-Oregon border, was considered and then eliminated as an alternative site location. Development of an LNG terminal at this location would require a substantial upgrade of existing pipeline infrastructure in order to reach Southern California, with environmental ramifications. In addition, offshore wind and wave conditions are unacceptable compared with those at the proposed Project site. Moreover, if LNG shipments were to originate in Australia, South America, or Southeast Asia, the shipping distance would be greater than that for a location in California and would add to the cost of the gas supply in comparison with the proposed Project; distances from Alaskan sources would be shorter but would provide a significantly smaller amount of LNG than other sources. This terminal location was eliminated from further evaluation because inadequate site suitability, safety, other environmental concerns, and lack of economic viability make this potential alternative not reasonable.

3.3.5.2 Northern California/Southern Oregon

The Eureka area was examined because it is the only location in the Northern California/Southern Oregon region with access to Pacific Gas and Electric Company's (PG&E's) main gas transmission systems. However, costs of improving existing access to these gas transmission systems were deemed high. This alternative would also be located far from Southern California and would require significant new pipeline construction, thereby incurring high pipeline tariffs and not reducing environmental impacts relative to those impacts identified for the proposed Project. Additionally, wave and wind conditions outside the harbor can be severe and therefore render the site

unsuitable for an offshore terminal. In its 1978 Offshore LNG Terminal Study (see Subsection 3.3.6.3 for more details), the California Coastal Commission (CCC) eliminated areas between Point Conception and the Oregon border because of the adverse weather conditions (California Coastal Commission September 15, 1978). This alternative was reconsidered to determine whether conditions had changed. This alternative is not reasonable and was eliminated from further evaluation because of the lack of economic viability, inadequate site suitability, and other safety and environmental concerns.

3.3.5.3 Northern/Central California

Potential regional alternatives considered in the northern and central California region considered included sites within San Francisco Bay and Monterey Bay. As stated above, the CCC eliminated areas between Point Conception and the Oregon border in its 1978 Offshore LNG Terminal Study because of the adverse weather conditions. These alternatives are reconsidered in this EIS/EIR, however, to ascertain whether conditions have subsequently changed.

The alternative in San Francisco Bay was eliminated from further evaluation because of the lack of suitable sites within the Bay and because the waters outside the Bay are classified as a National Marine Sanctuary. There are no available sites in remote areas within the Bay where a terminal could be located, and a previously proposed onshore terminal at Mare Island was dropped from consideration due to public concern. Congested waterways and navigation areas present a hazard for LNG carriers. Therefore, this potential alternative was eliminated because it is not reasonable.

Siting a terminal anywhere offshore in Monterey Bay would mean that the terminal and/or the offshore pipeline would have to cross through the Monterey Bay National Marine Sanctuary. Industrial development would conflict with the federally designated intended use of this area. The existing pipeline infrastructure in this region would also require significant upgrade or construction of a new large-diameter pipeline to deliver Project gas to the PG&E main gas transmission systems. In addition, a lack of protected areas for LNG carriers would limit operating periods because of the severity of winter storms.

This alternative also would be located far from Southern California and would require new pipeline construction, thereby incurring high pipeline tariffs and not reducing environmental effects relative to those effects identified for the proposed Project.

This potential alternative was eliminated because of extreme wind-wave conditions that would not be favorable for an LNG facility and because it would conflict with the intended use of the marine sanctuaries.

3.3.5.4 Southern California/Northern Mexico

San Diego Harbor is unsuitable for an LNG terminal because it would likely interfere with the operations of the U.S. Navy's Pacific Fleet, which is based in the harbor. Significant recreational boating in San Diego Harbor would also pose a difficult security

and safety issue for the terminal and for LNG carriers. Significant numbers of chemical and conventional weapon dumpsites constrain suitable locations outside San Diego Harbor as well. For the terminal facility and pipeline to avoid these sites, the terminal would have to be sited near the major north-south shipping lanes, which is incompatible with necessary safety buffers. As stated above, the CCC eliminated areas offshore of San Diego in its 1978 Offshore LNG Terminal Study. Therefore, because a reasonable site could not be identified, this location was eliminated from further consideration.

3.3.6 Specific California Locations

Although many areas along the coast of California would be unsuitable for an offshore LNG terminal, locations from Point Conception south to north of the San Diego Harbor have been considered in the past as potential locations. The history of this analysis is discussed below.

3.3.6.1 LNG Terminal Siting Act of 1977

In the early 1970s, several public utilities proposed LNG import facilities at the Port of Los Angeles, Oxnard, and Point Conception. However, the agencies involved in site approval could not agree on a preferred site. To resolve the stalemate, at least at the State level, the California Legislature enacted the LNG Terminal Siting Act of 1977 (formerly California Public Utilities Code §§5550 *et seq*.; this Act has since been repealed). Under the Act, the CPUC, with input from the CCC and CEC, could approve one site.

3.3.6.2 CCC/CPUC Ranking and Selection of Onshore LNG Terminal Sites and CCC Offshore LNG Terminal Study (1978)

In 1978, under the mandate of the California LNG Terminal Siting Act, the CCC studied, based on sites nominated by the public and the CCC, 82 onshore and numerous offshore potential LNG terminal locations as a neutral, environmentally protective agency using specific siting criteria (California Coastal Commission May 24, 1978; September 15, 1978). These two studies represent the most comprehensive review of potential LNG terminal locations in California to date. The studies also included a public consultation process for both onshore and offshore studies, with more than 700 interested persons participating.

The CCC was not considering a specific application at the time; therefore, there was no bias for or against any location. Although the LNG Terminal Siting Act was repealed in 1987 and many technologies have improved (specifically, pipelines can be laid at greater water depths), the siting criteria are still relevant and useful in the evaluation of potential alternative site locations. The conclusions of these studies have been used as a starting point in the EIS/EIR's analysis of onshore and offshore LNG terminal alternatives in California. The following paragraphs summarize the conclusions of the CCC studies. The executive summaries for both studies are included in Appendix B.

The Act specified a population standard of a maximum of 10 people per square mile (2.6 square kilometer [km^2]) within 1 mile (1.6 km) of the terminal and a maximum of 60

people per square mile (2.6 km^2) within 4 miles (6.4 km). Other factors considered included wind, wave, and fog conditions, proximity to urban areas, earthquake faults, soil conditions, and rugged land (California Coastal Commission May 24, 1978).

The CCC concluded that any onshore LNG terminal would cause serious effects on coastal resources and that all proposed sites would lead to major adverse effects on natural marine and wildlife resources, public recreation areas, and other resources protected by the California Coastal Act of 1976. The marine environment would be disturbed by construction activities, including trenching, blasting, and pile driving. Regular LNG tanker maneuvering, fuel oil deliveries, and tug and line boat activity would continuously bring noise and activity in areas used by sea birds and mammals, including the California gray whale. Because all of the onshore locations are relatively remote and undisturbed, an onshore LNG terminal would also alter the character of the area and disturb valuable wildlife populations (California Coastal Commission May 24, 1978).

Four onshore sites were found to meet the criteria for an onshore LNG terminal location—that is, population standards—and to be feasible when adverse wind and wave conditions, earthquake faults, soil conditions, and other factors were considered (California Coastal Commission May 24, 1978). These four sites, in the order ranked by the CCC, were Horno Canyon in Camp Pendleton (San Diego County), Rattlesnake Canyon (San Luis Obispo County), Little Cojo near Point Conception (Santa Barbara County), and Deer Canyon (Ventura County). Subsequent to several recommendations made by the CCC (California Coastal Commission September 15, 1978), the CPUC eliminated Camp Pendleton, Deer Canyon, and Rattlesnake Canyon. The CPUC conditionally approved Point Conception (contingent upon demonstration of earthquake safety) because of its remote location, but the proponents cancelled the project when they determined that the then price of natural gas made LNG uncompetitive (California Coastal Commission May 24, 1978).

Concurrent with the preparation of the Onshore LNG Terminal Study, the CCC conducted a similar study for an offshore terminal. Major selection criteria specified that the site needed to be in water depths less than 750 feet (229 meters [m]) due to subsea pipeline constraints; have a gently sloping bottom topography; and have a hospitable wind, wave, and swell environment. These are discussed further in Subsection 3.3.6.5, "Alternative California Locations: Offshore." Areas offshore of Central and Northern California between Point Conception and the Oregon border were eliminated from serious consideration because of the adverse weather conditions. Other factors included the presence of military operations, ship traffic, and marine and coastal resources. No population criteria were applied to the siting of an offshore facility; however, locations within 4 miles (6.4 km) of a permanent population of 1,800 persons were eliminated. Thus, areas offshore of Los Angeles, Long Beach, and San Diego were eliminated.

The study evaluated seven zones and then 16 sites between Point Conception and the Mexican border. Eventually, seven sites were selected as potential terminal locations, including Ventura Flats, offshore of Deer Canyon, offshore of Camp Pendleton, offshore

of Chinese Harbor, offshore of Smuggler's Cove, offshore of San Pedro Point, and Bechers Bay. Ventura Flats was selected as the most optimal location.

Figure 3.3-1 shows onshore and offshore alternatives to the proposed Project and their locations.

3.3.6.3 Alternative California Onshore Locations

Although the LNG Terminal Siting Act was repealed in 1987, the siting criteria used by the CCC and CPUC in the 1970s are logically still applicable, as pointed out in CEC's 2003 Liquid Natural Gas in California: History, Risks, and Siting, Staff White Paper (Marks et al. August 2003). As stated above, the CCC selected Horno Canyon in Camp Pendleton, Rattlesnake Canyon, Little Cojo, and Deer Canyon as those that met its criteria for an onshore LNG terminal location, and the CPUC conditionally approved the Point Conception site, which was owned at the time by Southern California Edison and PG&E (Ahern 1980).

In the response to comments on the Notice of Interest/Notice of Preparation (NOI/NOP) prepared for the proposed BHP Billiton LNG International, Inc. (BHPB) Cabrillo Port LNG Deepwater Port, the current owners of the land at the Point Conception location approved in 1978—the Bixby Ranch, the Hollister Ranch, and the Archer Trust—object to the use of their land for industrial development and are considering putting a conservation easement on the property (Staffier 2004; Kimball 2004). Consequently, this site is not a feasible location for an onshore terminal.

In comparison with the site proposed by the Applicant, onshore LNG terminals would not substantially avoid or lessen any significant potential effects and would present more potential visual effects, land use conflicts, and risks to public safety because of the proximity to population centers. In addition, the USCG and MARAD may only consider a deepwater port (DWP) beyond 3 nautical miles (NM) (3.45 miles or 5.56 km) from shore. Onshore locations are not reasonable alternatives for this Project and were not considered further. A proposed onshore LNG terminal at the Port of Long Beach (proposed by Sound Energy Solutions), for which the Federal Energy Regulatory Commission (FERC) and the Port of Long Beach are preparing an EIS/EIR, is addressed in this EIS/EIR as a Cumulative Effect for Marine Transportation (see Section 4.20, "Cumulative Impacts Analysis").

3.3.6.4 Alternative California Locations: Offshore

Nine offshore sites were evaluated as potential alternatives to the proposed Project: the seven sites identified in the 1978 CCC Offshore LNG Terminal Study, as well as two sites identified during public scoping—Anacapa and the west side of the Channel Islands. A proposal by Crystal Energy to construct an offshore LNG terminal at Platform Grace, for which a separate EIS/EIR is anticipated to be prepared, is evaluated throughout this EIS/EIR as a Cumulative Effect (see Section 4.20, "Cumulative Impacts Analysis"). Evaluation criteria from the CCC study, updated to reflect current conditions, included: (1) ownership, use, and character of the area around each site zone; (2) site

availability; (3) recreational resources; (4) marine and terrestrial biology; (5) geologic and engineering considerations affecting terminal feasibility; (6) choice of design types; (7) pipeline routing feasibility and impacts; (8) maritime conditions; and (9) construction costs. All of the sites, except Ventura Flats were eliminated from further consideration for the reasons detailed below. Ventura Flats is discussed in Section 3.4.2, "Alternative Deepwater Port, Subsea Pipeline, Shore Crossing, and Onshore Pipeline Location—Santa Barbara Channel/Mandalay Shore Crossing/Gonzales Road Pipeline Alternative." For the purposes of this document, this alternative is called the Santa Barbara Channel/Mandalay Shore Crossing/Gonzales Road Pipeline Alternative.

Offshore of Deer Canyon

Although a floating terminal approximately 1 mile (1.6 km) offshore of Deer Canyon would be technically feasible, some of the factors that were considered favorable in 1978 are no longer favorable. For example, the Santa Monica Mountains were not a national recreation area until later in 1978 (National Park Service 2002). Moreover, even at the time, the CCC report recognized that there would be significant visual effects on nearby recreation areas, including Leo Carillo and Point Mugu State Parks and the Santa Monica Mountains. In addition, the report cited potential conflicts with the Pacific Missile Range Test Center activities and a State oil lease block holder. Therefore, this potential alternative was eliminated because it would not avoid or lessen any of the potential significant effects on the environment identified for the proposed Project, which would be located further offshore and that would not interfere with Point Mugu Sea Range activities, and therefore is not a reasonable alternative.

Offshore of Camp Pendleton

The site identified offshore of Camp Pendleton is approximately 1.5 to 3 miles (2.4 to 4.8 km) offshore of a long stretch of San Diego County coastline. Although this area meets water depth, population, and maritime criteria, it has greater potentially significant, aesthetic, recreational, safety, and land use impacts in comparison with the proposed Project location.

For example, given its location, it would be highly visible to a large number of people traveling on Interstate 5. Its presence also would degrade the recreational experience of beach visitors at San Onofre State Park and would restrict access for local boaters and sport fishers because there would be an exclusion zone around the facility and any approaching LNG tanker. Additionally, the population of the areas surrounding Camp Pendleton has increased since the original recommendation in 1978: San Clemente has grown by almost 23,000 people since 1980 and Oceanside has grown by almost 33,000 people since 1990 (City of Oceanside Planning Department August 15, 2001). In addition, there is a fault 4 miles (6.4 km) offshore. The U.S. Marine Corps also uses the waters off Camp Pendleton for amphibious warfare-training exercise. In June 2004 the Navy's Advanced Amphibious Assault Vessel (AAAV) ocean training area was extended seaward from 3 NM (4 miles or 6 km) up to approximately 25 NM (29 miles or 46 km) from Camp Pendleton beaches to conduct AAAV over-the-horizon training exercises. This use of the ocean offshore of Camp Pendleton by the Department of

Source: Ecology and Environment, Inc.

119°50'W 119°40' 119°30' 119°20' 119°10' 119°00' 118°50' 118°40' 118°30'W

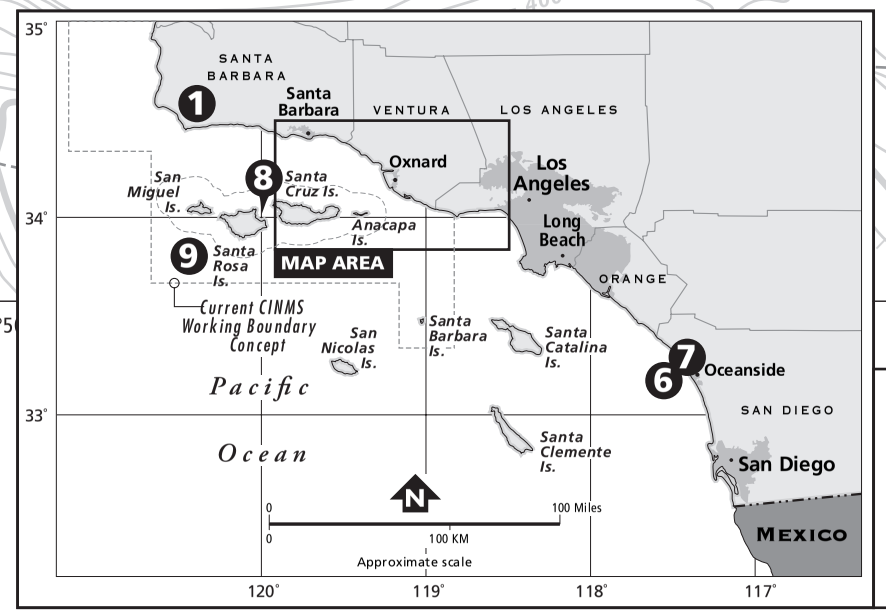
34°30'N 34°20' 34°10' 34°00' 33°50'N

SANTA BARBARA COUNTY
SANTA BARBARA
Goleta Point
Carpinteria
Rincon Point
Ojai
Santa Paula
Approx. location of 3-nautical mile line (California jurisdictional waters)
Pitas Point
100
200
Santa Barbara Channel (Ventura Flats)
VENTURA COUNTY
Ventura
Simi Valley
Gonzales Road Pipeline
SANTA BARBARA CHANNEL (alternative) 2
(not to scale)
RELIANT ENERGY MANDALAY GENERATING STATION SHORE CROSSING (alternative)
PLATFORM GILDA (not to scale)
Oxnard
Camarillo
Port Hueneme
Center Road Pipeline (proposed)
For detail see Figure 3.4-1
Thousand Oaks
LOS ANGELES COUNTY
MANDALAY PIPELINE (alternative)
NORTHBOUND COASTWISE TRAFFIC LANE
SEPARATION ZONE
SOUTHBOUND COASTWISE TRAFFIC LANE
CHINESE HARBOR 3 (alternative)
SAN PEDRO POINT 10 (alternative)
ANACAPA ISLAND
SANTA CRUZ ISLAND
11 SMUGGLER'S COVE (alternative)
HUENEME CANYON
Point Mugu
MUGU CANYON
4 OFF DEER CANYON (alternative)
5 DEER CANYON (alternative)
Malibu
Santa Monica
Malibu Point
Point Dume
Santa Monica Bay
DUME CANYON
SANTA MONICA CANYON
CINMS 6 Nautical Mile Boundary
ALT. ROUTE 2
ALT. ROUTE 3
ALT. ROUTE 1
ANACAPA (alternative) 12
(not to scale)
CABRILLO PORT (proposed)
Current CINMS Working Boundary Concept (as of 9/22/03)
PACIFIC OCEAN
Line 225 Loop Pipeline (proposed)
For detail see Figure 3.4-2
Santa Clarita
0 5 10 15 20 25 miles
0 25 kilometers
N

Proposed project
ALTERNATIVES CARRIED FORWARD
Santa Barbara Channel
Other alternatives
Offshore alternatives considered but eliminated

RELIANT ENERGY ORMOND BEACH SHORE CROSSINGS and PIPELINE CONNECTIONS
Reliant Energy Ormond Beach/Center Road (proposed)
Arnold Road/Arnold Road Pipeline (alternative)
Point Mugu/Casper Road Pipeline (alternative)

Map depicts approximate locations based on best available data.
Bathymetric contours are in fathoms.



ALTERNATIVE PROJECT LOCATIONS

1. Point Conception
2. Santa Barbara Channel (Ventura Flats)
3. Chinese Harbor
4. Off Deer Canyon
5. Deer Canyon
6. Off Camp Pendleton
7. Camp Pendleton
8. Bechers Bay
9. West Side of Channel Islands
10. San Pedro Point
11. Smuggler's Cove
12. Anacapa

CABRILLO PORT LNG DEEPWATER PORT EIS/EIR, 2004

Figure 3.3-1

Cabrillo Port Liquefied Natural Gas Deepwater Port and Proposed Project Alternatives Considered

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Defense could be precluded by the safety zone that would surround the LNG terminal and might also be affected when LNG carriers transit to and from the facility.

Major General W.G. Bowdon, the commanding general of Camp Pendleton, wrote to the CSLC in May 2004 that the Marine Corps absolutely opposes the establishment of an LNG terminal on or near the coastline of Camp Pendleton because it would impede the military's ability to accomplish its mission (Bowdon 2004). However, in subsequent statements, Lt. Gen. Richard L. Kelly, the Marines' deputy commandant for installations and logistics stated: "The Marine Corps does not object to any LNG industry assessment to site a facility in the vicinity of Camp Pendleton. Any final decision to allow siting of an LNG facility in the vicinity of Camp Pendleton must be based upon a thorough assessment and mitigation of potential impacts on readiness, sustainment, safety, security, and compatibility with Marine Corps training" (Schoch June 15, 2004).

After comparing this offshore site to that of the proposed Project, this alternative was eliminated from further consideration as an alternative to the proposed Project, because it is closer to shore and because there are greater potential significant impacts to recreation, visual resources, and safety as well as potential land use conflicts.

Offshore of Chinese Harbor, Smugglers Cove, San Pedro Point, and Bechers Bay

The Chinese Harbor, Smugglers Cove, and San Pedro Point locations are offshore of Santa Cruz Island, and the Bechers Bay location is offshore of Santa Rosa Island. All of these sites are considered unacceptable because of their location within the Channel Islands National Park (CINP) and National Marine Sanctuary, established in 1980[1], and the biological significance of the surrounding resources. Approval of an LNG facility in these locations is highly unlikely because it would conflict with the National Park's or Sanctuary's intended land use. Therefore, these potential alternatives were eliminated from further consideration.

Anacapa

The Anacapa alternative location was proposed by the Applicant and is approximately 14 NM (16 miles or 25.8 km) offshore of Point Mugu and approximately 9.5 NM (11 miles or 17.7 km) from Anacapa Island, which is part of the CINP and the CINMS (see Figure 3.3-1). This alternative location would be inside the Pacific Missile Range but would meet other location criteria. However, the U.S. Navy has indicated that siting a terminal within the Pacific Missile Range would be unacceptable because of the nature of the activities conducted there. Therefore, this potential alternative was eliminated from further consideration because it was not a reasonable alternative.

[1] Channel Islands National Park (CINP) was established in 1980 by Public Law 96-199. The waters within 6 NM ((6.9 miles or 11.1 km) of the northern Channel Islands (San Miguel, Santa Rosa, Santa Cruz, and Anacapa Islands) and Santa Barbara Island were formally designated as a national marine sanctuary in 1980 in accordance with Title III of the Marine Protection, Research, and Sanctuaries Act. The sanctuary lies between 8 and 40 NM (9.2 and 46 miles, or 14.8 and 74 km) off the Southern California mainland, north of Los Angeles and immediately south of the Santa Barbara Channel (see National Park Service 2003).

West Side of the Channel Islands

A suggestion was made during the public scoping period that an alternative location for the FSRU should be on the west side of the Channel Islands (see Figure 3.3-1). This alternative was considered but not retained for full analysis because it would be located within the CINMS. Additionally, water depths are greater than at the proposed mooring location, slopes are steep, and wind/wave conditions can be severe, making it difficult to site a submarine pipeline route from this location to the shore. This area is also on many whale migration routes.

3.3.7 Alternative Deepwater Port Concepts

Two DWP technology concepts that were considered as potential alternatives, but eliminated from further consideration in this document, are a fixed offshore LNG terminal and a gravity-based structure. The reasons for their elimination are detailed below.

3.3.7.1 Fixed Offshore Liquefied Natural Gas Terminal Alternatives

There are two possible fixed offshore LNG platform-based terminal alternatives: use of an existing oil platform or construction of a new platform. Descriptions of these alternatives and the reasons for their elimination from further consideration are discussed below.

Existing Platform-Based Terminal Alternative

One fixed terminal alternative involves reusing an existing offshore oil platform. Currently, there are 27 platforms operating in Federal or State waters in the Santa Barbara Channel, Santa Maria Basin, and offshore of Los Angeles/Long Beach; at present, these structures are directly or indirectly associated with existing oil and gas production. Platforms were not built to berth LNG carriers. Analysis of what would be required to retrofit a platform is beyond the scope of this document.

Conversion of an operating platform and obtaining the legal authority to operate as a different type of facility than originally permitted can be costly and time-consuming because the Outer Continental Shelf Lands Act currently requires complete abandonment of a platform that is no longer directly or indirectly involved in oil and gas production. Simultaneous operations of LNG and oil and gas production pose significantly greater potential impacts than LNG operations alone, including the potential for oil spills and potentially conflicting activities within the safety and precautionary zones, and require detailed risk assessment of simultaneous operations that are beyond the scope of the proposed Project. The addition of berthing capability to the platform would also create a larger object in the viewshed and would extend the life of an existing adverse visual effect.

The potential existing platform-based terminal alternative was eliminated as an alternative to the proposed Project because current law does not make this alternative feasible, it would not accomplish most of the objectives and purposes of the proposed

Project, and it would not avoid or substantially avoid or lessen environmental effects. A proposal by Crystal Energy to construct an offshore LNG terminal at Platform Grace, for which a separate EIS/EIR is anticipated to be prepared, is evaluated in this EIS/EIR as a Cumulative Effect (see Section 4.20, "Cumulative Impacts Analysis").

New Platform-Based Terminal Alternative

As discussed above, a platform-based terminal could be designed to receive and regasify LNG and send the natural gas to shore via a pipeline. It would, however, be technically infeasible to consider a platform at the same location as that of the proposed Project because platforms cannot be built at that ocean depth.

Given the level of public opposition to the existing platforms in the Santa Barbara Channel, an equivalent or greater level of opposition to any new proposed platform would be anticipated. Not only would a new platform have visual effects for those who live in and use the viewshed, but it would have greater environmental effects than conversion of an existing platform.

The platform would also create an additional navigational hazard in the Santa Barbara Channel, and the necessary exclusion zone would affect many maritime commercial and recreational activities because it would be in a high vessel-traffic area. Given that a new platform would be fixed to the seafloor, there would be an increased risk that it would be adversely affected by local seismic activity. Because the environmental and safety effects would be greater than those of the proposed Project, this alternative was eliminated from further evaluation.

3.3.7.2 Gravity-Based Structure

An alternative offshore concept is a fixed LNG terminal, such as a gravity-based structure. A gravity-based structure is one that remains secured to the seafloor, primarily by gravity. A gravity-based structure can be constructed onshore (usually from concrete), floated to a site, and installed to provide an offshore enclosure and foundation for LNG tanks and a stable deck for regasification equipment. Factors influencing this concept include constructability, weather, safety, shipping, environmental setting, and regulatory permitting. Such a facility could be placed on a leveled and stabilized part of the seabed.

However, gravity-based structures are not suited to the depth of water at the location of the proposed Project and therefore would have to be located closer to shore. In general, gravity-based structures are feasible only in waters less than 350 feet (106.7 m) deep because of the physical restrictions of constructing a concrete structure. Therefore, a gravity-based structure in this region would have to be located closer to the shipping lanes and shipping traffic, where it could present greater restrictions for vessel traffic and would pose a greater risk of collisions than the proposed Project. In addition, a facility that is closer to shore would pose greater visual effects and potential safety issues than the proposed Project.

This potential alternative terminal technology was thus eliminated because of its technical infeasibility at the proposed location and because at any other location it would not avoid or substantially lessen any of the environmental effects identified for the proposed Project.

3.3.7.3 Floating Offshore Liquefied Natural Gas Terminal

Single-Point Mooring Direct Regasification

The single-point mooring direct regasification concept was considered but eliminated as an alternative because it does not serve the purpose and need of the proposed Project and is not feasible at this location. This DWP concept would use a flow-through, single-point mooring such as that proposed for the Excelerate's Gulf Gateway Bridge (formerly El Paso Energy Bridge Gulf of Mexico) terminal (see Figure 3.3-2). The type of regasification technology used is called "shell and tube." In this technology, multiple smaller diameter tubes are housed in a larger tube that acts as a shell.

LNG is transported through the smaller tubes and seawater flows through the larger tube, allowing heat transfer between the two fluids separated by the tube wall. The use of tubes increases surface area; however, minimal tolerances create higher fouling rates. With this technology, specially designed LNG carriers with onboard regasification equipment would connect to a single-point mooring, which would be submerged between unloadings. After mooring, the LNG carrier would regasify the LNG onboard and pump the resulting natural gas through the mooring point to a subsea pipeline.

Source: Excelerate Energy 2004.

Figure 3.3-2 Example of an Energy Bridge Terminal

An objective of the proposed Project is to develop a DWP that would provide enough natural gas storage capacity to enable it to supply a continuous, reliable baseload to

local energy markets. This alternative cannot fulfill this objective. The single point-mooring concept is designed only to meet intermittent market demand. It has no storage capacity and only can provide natural gas when an LNG carrier is berthed. If an LNG carrier could not berth with the mooring system due to weather, no natural gas could be supplied. According to the Environmental Assessment of the El Paso Energy Bridge Gulf of Mexico DWP License Application (United States Coast Guard 2003), a single LNG carrier can transport a maximum of 36.4 million gallons (138,000 cubic meters [m^3]) of LNG and require approximately six days to unload and regasify its load. In contrast, the proposed FSRU has a storage capacity of 72 million gallons (273,000 m^3) and all the gas is readily available at any time. In addition, the relatively large number of LNG carriers that could call at the FSRU (165 with an additional 85 on order) adds to the reliability, in contrast to the few LNG carriers equipped to regasify on board. Therefore, this DWP concept cannot meet the objective of providing baseload supply.

Further, the preferred water depths for this technology are between 164 feet (50 m) and 492 feet (150 m) (United States Coast Guard 2003). To accommodate these depths in this area, the mooring point would have to be located within 3 NM (3.45 miles; 5.56 km) of shore. As a result, this alternative would have greater adverse effects on recreation, fisheries, aesthetics, marine traffic, and marine biota in comparison to the proposed Project. In addition, at this distance from shore, it would cease to be considered a deepwater port. Therefore, it would not meet the purpose and need of the proposed Project.

3.3.8 Alternative Vaporizer Technologies

All vaporizer technologies involve pumping LNG through a heating medium where the LNG absorbs heat and is vaporized into natural gas. Two proven alternative technologies are the intermediate fluid vaporizer and the open-rack vaporizer. Although these alternatives would have lower air emissions of nitrogen oxides and carbon dioxide compared with submerged combustion vaporization, both were eliminated due to other disadvantages discussed below.

The open-rack vaporizer technology is not compatible with a floating facility because it requires a stable platform in order to provide a uniform flow of water over the heat exchanger tubes. Movement of the FSRU resulting from expected ocean conditions and the resultant motion of the open-rack vaporizer would cause inconsistent downfall of the water onto the vaporizer tubes. Motion of the FSRU may cause water in the open rack to slosh around, disrupting the vaporization process. The relatively low temperature of the seawater at the proposed Project location also may not be optimal for use in an open rack system. Additionally, there are greater impacts on marine biota, e.g., entrainment, that result from the intake of seawater as a heating medium.

Intermediate fluid vaporizers would require the use of propane or other intermediate heating fluids such as glycol. Propane is more volatile than LNG and therefore would introduce an additional element of risk. This alternative would have fewer emissions than a submerged combustion vaporizer; however, intermediate fluid vaporizors would

require additional power generation capability, assumed to be near 30 megawatts (MW) for power to the pumps and/or immersion heaters.

The two potential alternatives would require more than 50 million gallons (189,259 m^3) of seawater per day and have a larger footprint on the FSRU than submerged combustion vaporizers. Seawater would flow through the vaporizers and return to the ocean at a lower-than-ambient temperature. In this area are sensitive marine resources that could be adversely affected through entrainment and impingement, cold-water discharges, discharge of treated water, and noise. The water intake would also require onboard pumps, which would generate noise audible above and below water that could disturb marine mammals that migrate in this area. In addition, maintenance of the water intake filter and piping would require the use of antifouling chemicals, which are hazardous. Discharge of these chemicals could have adverse effects on marine organisms.

The open-rack vaporizer and intermediate fluid vaporizer technologies would be anticipated to have a greater effect on marine biota in the area compared with submerged combustion vaporization. Also, an open-rack vaporizer may not be feasible on a floating facility. As a result, both open-rack vaporizer and intermediate fluid vaporizer technologies were eliminated from further consideration as alternative regasification processes.

3.3.9 Alternative LNG Storage Technologies

An alternative to a Moss tank, which the proposed Project would use, is a membrane-type storage tank. Membrane-type storage tanks are built into the inner ship hull and avoid the spherical shape of Moss tanks. An FSRU or LNG carrier using the membrane-type alternative would have a lower profile on the water and less of a visual effect. The FSRU tanks operate at variable LNG levels, depending on whether they are receiving, holding, or sending out LNG.

For the purposes of this application, MARAD does not prefer any alternative LNG storage technologies. Instead, MARAD relies on the LNG industry to determine the appropriate technology to safely and reliably serve its intended business purposes. MARAD believes that any of these technologies can be acceptable in terms of safety, operability, availability, and environmental protection. Therefore, MARAD will evaluate the merits of each application on a case-by-case basis and require each applicant to provide a rational and objective analysis of alternative LNG storage technologies. The USCG is conducting a detailed evaluation of the engineering and reliability of Moss tank LNG storage technology, which will be considered during review of the Operations Plan.

Because the Moss tank LNG storage technology has been found acceptable in terms of safety, operability, availability, and environmental perspectives, MARAD's screening has found no compelling reason to reject it as the preferred component of the proposed Project. Accordingly, the use of a membrane-type storage tank has been eliminated from further analysis.

3.3.10 Alternative Pipeline Shoreline Crossing Technologies

Horizontal directional drilling (HDD), the method proposed by the Applicant, and trenching methods can be used for the shoreline crossing of pipelines. HDD typically involves use of an HDD rig that drills from onshore to a predetermined exit hole in the ocean floor offshore. The borehole is then reamed to increase the diameter. The pipeline can then either be pulled from onshore through to the exit hole, using barge-mounted pulling equipment, or can be pulled back from the barge to the onshore drill site, using onshore pull-back equipment. The pulling operation is continuous to minimize the chance of hole collapse.

In trenching, heavy equipment is used to dig the appropriately sized trench for the length of a pipeline route and any biota living within the construction corridor of the trench are crushed, buried, or dislodged. The shoreline at any of the proposed shore-crossing alternatives has the potential to contain special-status species.

Trenching would have much greater impacts on the surrounding environment than HDD because the impacts of HDD are limited to the entrance and exit hole staging areas. Therefore, trenching has been eliminated as a shore-crossing technology because it would not avoid or lessen the environmental effects identified for the proposed Project and is therefore not reasonable.

3.3.11 Alternative Offshore Pipeline Routes

Three pipeline route alternatives between the Applicant's proposed mooring point for the FSRU and the proposed shoreline crossing at Ormond Beach were evaluated but were eliminated from further consideration. Another offshore pipeline route was considered from the proposed FSRU and Mandalay Beach. These are discussed below. A fifth route associated with an alternative mooring location has been retained for further consideration and is described in Subsection 3.4.2, "Alternative Deepwater Port, Subsea Pipeline, Shore Crossing, and Onshore Pipeline Location—Santa Barbara Channel/Mandalay Shore Crossing/Gonzales Road Pipeline Alternative." Figure 3.3-3 shows the offshore and onshore topography of Southern California. As shown, the location of offshore pipelines is constrained by the presence of deep canyons, including Hueneme and Mugu Canyons.

3.3.11.1 Alternative Offshore Pipeline Route 1

Alternative Route 1 would run between two small canyons with few geologic or seismic hazards or natural obstructions. While there are no major natural obstructions along the proposed pipeline route, it would run parallel and close to, or across, several known manmade structures and restricted areas. These include two surface-laid U.S. Navy cables (FOCUS and RELI), one potentially buried telecommunications cable (Global West Segment F), and a Navy cable corridor and firing range. The total length of Alternative Route 1 would be 17.5 NM (20.2 miles or 32.5 km), approximately 0.8 NM (0.9 mile or 1.5 km) shorter than the proposed route. This alternative would run parallel to the Navy cables for a greater distance than the proposed route and would cross more

of the seafloor under Navy jurisdiction. Because of the greater length that this alternative pipeline route parallels the Navy cables (in comparison with the proposed pipeline route), construction and maintenance activities could interfere with Navy activities and pose greater risk of damaging the cables, which are vital to Navy operations; therefore, this alternative was eliminated from further consideration.

3.3.11.2 Alternative Offshore Pipeline Route 2

Alternative Route 2 would run west of the proposed pipeline route and west (as much as possible) of both Navy cables and their safety corridor. From there, the route would run toward the Navy cable corridor, across a relatively featureless seabed. At approximately 0.5 mile (0.8 km) of water depth, the route would head northwest and enter the Navy cable corridor. To ensure compliance with the anticipated Navy engineering requirements, this section of the route would cross the RELI and FOCUS cables with an angle as close as possible to 90°.

At approximately 0.4 mile (0.6 km) of water depth, the route would leave the Navy cable corridor and enter Hueneme Canyon, not always perpendicularly to the slope, to a water depth of approximately 984.3 feet (300 m). Slope gradients in this area are likely greater than 10° in places. For this reason, and because studies have shown that the canyon is still active and may be affected by slope failure, slides, and turbidity currents (particularly in an earthquake), the pipeline is likely at greater risk in this area. Therefore, this alternative route was eliminated from further consideration.

3.3.11.3 Alternative Offshore Pipeline Route 3

Alternative Route 3 would avoid the Navy cable corridor as much as possible by staying east of the Navy cables, except for the crossing point. From the mooring point, the route would run northwest for approximately 4 miles (6.4 km), then north. The route would cross the Global West cable at a water depth of approximately 0.5 mile (0.8 km). It would then climb up the continental slope in an area with maximum gradients of approximately 6° and along a smooth and wide ridge between Mugu Canyon and a smaller channel to the west. In the upper part of the slope, between 131.1 and 196.9 feet (40 and 60 m) of water depth, the route would pass 0.4 to 0.5 mile (0.7 to 0.8 km) east of a buoy-testing area. It would then turn west to cross the Navy cable corridor and avoid the head of Mugu Canyon. Alternative Route 3 would run between the two navigation buoys, through the Navy cable corridor, and across the RELI and FOCUS cables. This route would cross the Navy cables where they have been buried to 1 to 2 feet (0.3 to 0.6 m).

The total length of Alternative Route 3 would be 18.15 NM (20.9 miles or 33.6 km), which is 0.17 NM (0.2 mile or 0.3 km) shorter than the proposed route. This route would run parallel to the beach and in shallow waters over a distance of approximately 2.5 NM (2.9 miles or 4.7 km). At this depth, the pipeline would likely be exposed to wave surge during large storms. Running parallel to the shoreline would exacerbate this hazard. In addition, the route would run relatively close to the head of Mugu Canyon, which is

potentially seismically active, particularly during flooding and strong storms. For these reasons, Alternative Route 3 was eliminated from further analysis.

3.3.11.4 Mandalay Pipeline Alternative

The Mandalay Pipeline Alternative would extend northwest from the FSRU, cross Hueneme Canyon, and continue north for a shoreline crossing at the Reliant Energy Mandalay Generating Station (see Figure 3.3-1). This alternative pipeline route would have to cross through waters offshore of Port Hueneme. During pipeline construction and any potential repairs, vessel traffic at Port Hueneme would have to be curtailed, which would have significant implications for vessel traffic and safety and the economic welfare of Port Hueneme. Therefore, this potential alternative pipeline was eliminated as an alternative component of the proposed Project because it did not represent a reasonable alternative and would not avoid or lessen significant environmental effects identified for the proposed Project.

3.3.12 Alternative Onshore Pipeline Locations

The Applicant considered four alternative pipeline routes to connect the shore crossing with the Center Road Station; Alternatives 1, 1A, 1B, and 2. In response to scoping comments, the Applicant modified the proposed Center Road Pipeline route. The EIS/EIR Project Team eliminated Alternatives 1A and 1B from further consideration as discussed below; analyses of Alternatives 1 and 2 can be found in Subsection 3.4.4.1 and 3.4.4.2 “Center Road Pipeline Alternative 1” and “Center Road Pipeline Alternative 2.”

Both Alternatives 1A and 1B would follow existing rights-of-way (ROWs), public roads, and/or newly acquired easements. Alternative 1A would:

- Begin at the new metering station adjacent to the Reliant Energy Ormond Beach Generating Station shore crossing and then run northeast and north along a Southern California Gas Company (SoCalGas) ROW and northeast on Pleasant Valley Road past Rice Avenue;
- Continue north through agricultural fields in alignment with Del Norte;
- Cross Fifth Avenue and continue north, following Del Norte Boulevard to U.S. Highway 101;
- Continue to follow Del Norte Boulevard south of the highway and then cross the highway perpendicular to Central Avenue and in alignment with Beardsley Road;
- Cross Beardsley Road and Beardsley Wash and head northeast for approximately 0.25 mile (0.4 km), where it would head southwest along a drainage ditch to Santa Clara Avenue;
- Follow Santa Clara Avenue northeast and then continue northeast at Los Angeles Avenue, north at La Vista Avenue, and west at Center Road; and;
- Terminate at the Center Road Valve Station.

Alternative 1B would combine the existing ROWs along Route Alterative 1A with the proposed route. Alternative 1B would:

- Begin at the new metering station adjacent to the Reliant Energy Ormond Beach Generating Station shore crossing and then run northeast and north along a SoCalGas ROW, northeast on Pleasant Valley Road, and then north on Rice Avenue;
- Proceed from Rice Avenue east on Sturgis Road and north on Del Norte Boulevard to U.S. Highway 101; and
- Follow the same route as Alternative 1A from U.S. Highway 101 to the pipeline termination point at the Center Road Valve Station.

Alternatives 1A and 1B presented significantly more adverse safety or environmental effects than the proposed route. Alternative Routes 1A and 1B would pass in front of at least five schools and one residential care facility and would traverse the most densely populated area along any of the proposed routes. Construction in the residential areas and in front of the schools and residential care facilities would increase traffic congestion, noise, air pollution (particulates), and safety concerns for a larger population than would the proposed route. A larger number of lower income and minority populations would also be affected. Because neither route avoids nor lessens adverse effects identified for the proposed Project, Alternatives 1A and 1B were eliminated from further consideration. Figure 3.3-2 demonstrates how regional topography constrains onshore pipeline routes.

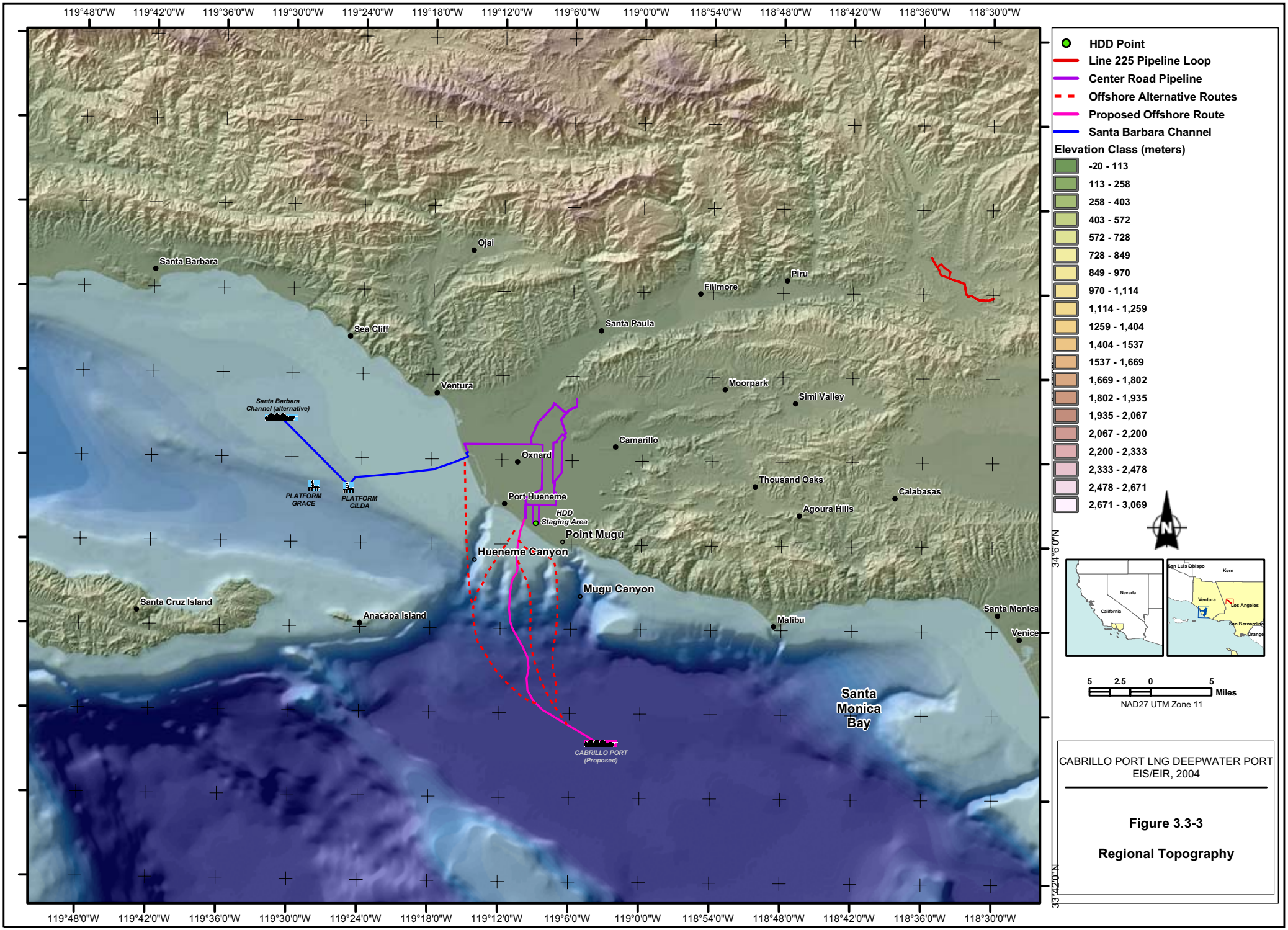
3.4 ALTERNATIVES EVALUATED IN THE ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT

The alternatives that were retained for analysis in this EIS/EIR are grouped into the following categories:

- No-action alternative;
- Alternative DWP, subsea pipeline, shore crossing, and onshore pipeline location;
- Shore crossing alternatives; and
- Alternative onshore pipeline routes.

3.4.1 No-Action Alternative

This document refers to the continuation of existing conditions of the affected environment, without implementation of the proposed Project, as the *no-action alternative*. Inclusion of the no-action alternative is prescribed by the Council on Environmental Quality (CEQ), NEPA regulations, the CEQA, and the State CEQA Guidelines and serves as a benchmark against which Federal and State actions can be



CABRILLO PORT LNG DEEPWATER PORT
EIS/EIR, 2004

Figure 3.3-3

Regional Topography

\\bufnt\GIS\sanfrancisco\cabrilloport\Maps\MXD\letter\Fig3-3-3.mxd 10-12-2004 GRC

Source: Entrix 2004

evaluated. Under the no-action alternative, MARAD would deny the license application and/or the CSLC would deny the lease. In either case, the Project would not proceed. Additional infrastructure, as proposed by the Applicant, would be neither built nor brought on-line.

Under the no-action alternative, the demand for natural gas in Southern California would not be satisfied by the Project and would have to be met by other options. If projected natural gas demand is unmet, prices could rise. This could result in installation of more pipelines or proposals for other offshore or onshore LNG facilities. If natural gas supplies continue to be constrained, then industrial power suppliers may be forced to rely on less expensive, but higher polluting energy sources such as coal, nuclear, or oil.

3.4.2 Alternative Deepwater Port, Subsea Pipeline, Shore Crossing, and Onshore Pipeline Location — Santa Barbara Channel/Mandalay Shore Crossing/Gonzales Road Pipeline Alternative

One alternative location for the mooring point of the FSRU — in the Santa Barbara Channel (called the Santa Barbara Channel/Mandalay Shore Crossing/Gonzales Road Pipeline Alternative) — was determined to be a reasonable alternative and has been carried through the alternatives analysis (see Figure 3.3-1). Like the proposed Project, this alternative could meet short- and mid-term natural gas demand. The proposed mooring point location is approximately the same as that of the Ventura Flats alternative site examined in the 1978 CCC study of potential offshore LNG terminal sites and technologies. Located 6.9 NM (8 miles or 12.9 km) offshore of Pitas Point in the eastern Santa Barbara Channel, it was determined by the CCC to be one of the most appropriate sites in California for a floating facility or a gravity-based structure based on the selection criteria described in Section 3.3.6, “Specific California Locations.” The study identified the feasibility of using a floating facility at this location or a gravity-based structure in the northwestern part of Ventura Flats (California Coastal Commission September 15, 1978).

The proposed mooring point location is approximately 7.4 NM (8.5 miles or 13.7 km) offshore of Rincon Beach and approximately midway between the existing Grace and Habitat production platforms in the Santa Barbara Channel. The alternative mooring location would be located at latitude 34°14.410’N, longitude 119°30.916’W. This alternative would meet safety criteria because it would be more than 2.6 NM (3 miles or 4.8 km) from shipping lanes and existing facilities. It would be approximately 5.8 NM (6.7 miles or 10.7 km) landward from the coastal shipping lanes and more than 4.2 NM (4.8 miles or 7.8 km) from the nearest offshore production platform. Visual effects would be a concern for this alternative.

Pipeline routes connecting an FSRU at this location to the existing SoCalGas facilities at Ormond Beach would be difficult to locate since they would have to either cross or go around Hueneme Submarine Canyon. Given the depth and geologic instability in the vicinity of this canyon, the only viable route is south of the canyon. This route would require the pipeline to be located in or near coastal shipping lanes. Therefore, these routes connecting to Ormond Beach were not considered.

The most viable pipeline alternative for the Santa Barbara Channel mooring location would be to route the pipeline from the mooring location to the Reliant Energy Mandalay Generating Station shore crossing, north of Port Hueneme, where existing natural gas facilities also exist. These facilities would require upgrades to accommodate the transfer of the volume of gas being transported onshore. The Mandalay Generating Station is located near Oxnard Shores in the City of Oxnard, and the pipeline would traverse parts of the City of Oxnard. The Reliant Energy Mandalay Generating Station shore crossing is located between McGrath State Beach and Mandalay Beach Park.

The offshore pipeline would start at the mooring point in water approximately 270 feet (82.3 m) deep and travel approximately 1.6 NM (1.8 miles or 2.7 km) southeast to the vicinity of two existing petroleum pipelines that extend north from Platform Gilda to Carpenteria. The natural gas pipeline would then continue southeast approximately 5.6 NM (6.4 miles or 10.4 km) towards the east side of Platform Gilda, where it would turn due east 8.3 NM (9.5 miles or 15.4 km). This route would generally follow an existing pipeline ROW before it diverges in State waters and heads to the Mandalay Generating Station.

Similar to the proposed Project, the shoreline crossing would be accomplished with HDD. The HDD exit points would be in a water depth of 43 feet (13 m), approximately 1.0 NM (1.15 miles or 1.8 km) from the shoreline. The HDD entrance point would be at an unspecified location at the Reliant Energy Mandalay Generating Station shore crossing. The length of the bore would be approximately 1.25 NM (1.4 miles or 2.3 km).

From the Reliant Energy Mandalay Generating Station shore crossing, the pipeline route would be installed primarily in existing road ROWs. The pipeline would travel north along Harbor Boulevard and turn east at West Gonzales Road. The pipeline would follow West Gonzales Road to East Gonzales Road until Rose Road, where it would meet Center Road Pipeline Alternative 1 at Milepost (MP) 8.0 and would follow that route to the Center Road Valve Station. This route is also one of the proposed alternative routes associated with the Crystal Energy Clearwater Port LNG Project.

Like the proposed Project, a pipeline would have to be constructed in Santa Clarita along Line 225 Pipeline Loop. The route through Santa Clarita for this alternative would be the same as the Line 225 Pipeline Loop proposed route.

3.4.3 Shore Crossing Alternatives

Two shore crossing alternatives for the proposed Project were retained for evaluation in this document and are described below. They represent alternative routes between the HDD entry and exit points and the connection to the SoCalGas pipeline ROW.

3.4.3.1 Arnold Road Shore Crossing/Arnold Road Pipeline Alternative

The Arnold Road Shore Crossing/Arnold Road Pipeline Alternative begins approximately at the same HDD exit points as the proposed Project and ends at a connection at approximately MP 1.9 of the proposed Center Road Pipeline route at Hueneme Road and Arnold Road (see Figures 3.3-1 and 3.4-1).

Base map source: *Figure 5.7-1, Transportation – Center Road and Alternative Pipeline Routes,* Entrix, December 9, 2003

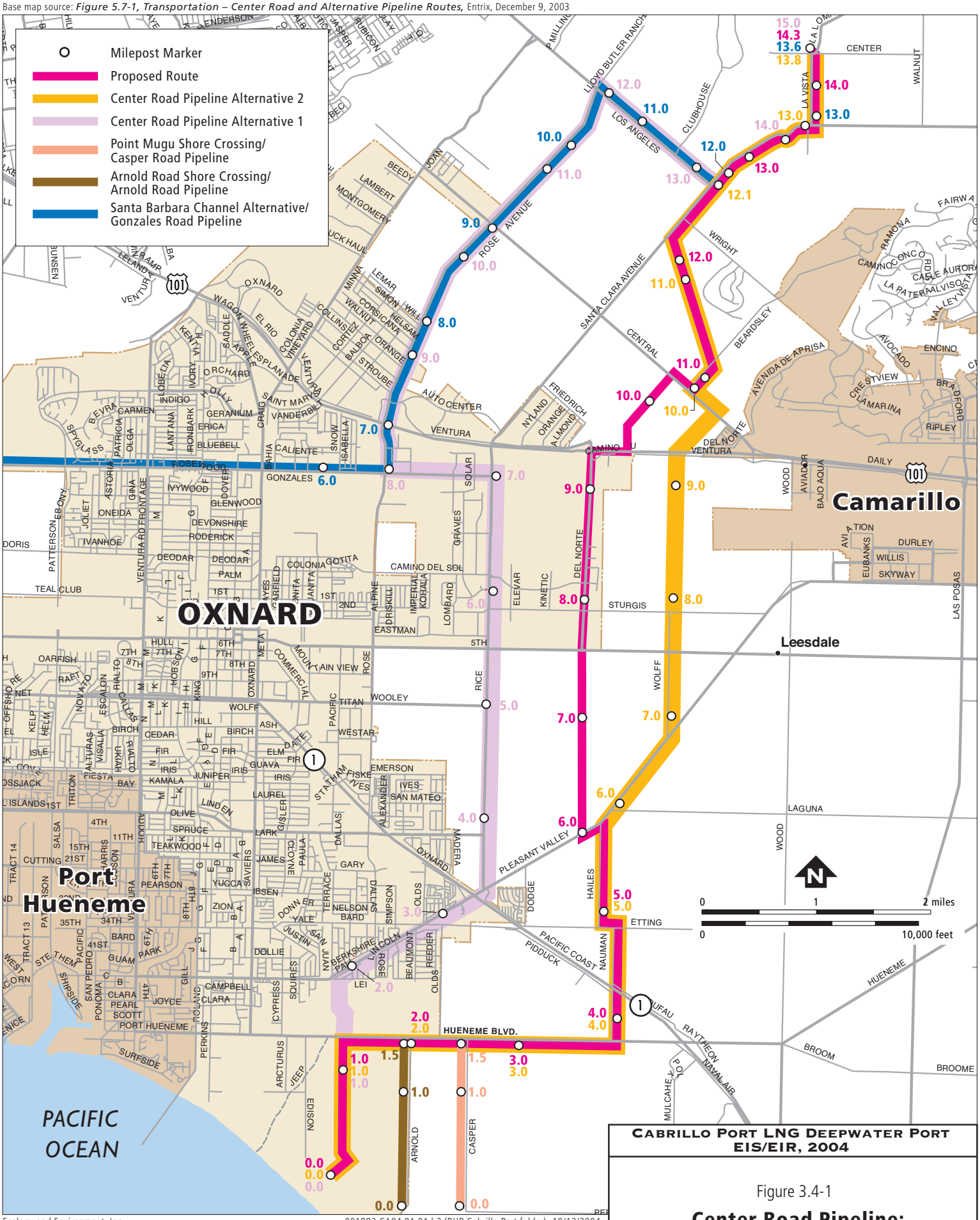


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Figure 3.4-1

Center Road Pipeline: Proposed and Alternative Routes

This alternative would extend from the offshore HDD exit points approximately 1.2 miles (2.0 km) to the HDD entry points located approximately 1,000 feet (305 m) inland from the shoreline, near the end of Arnold Road, on lands in unincorporated Ventura County. The HDD exit points would be the same point selected for the proposed Project, at approximately MP 20.5 of the subsea pipeline route. From the HDD entry points, HDD also would be used to install the pipeline to the surface facility located approximately 0.6 mile (1.0 km) inland along Arnold Road on previously developed lands. The two 24-inch (0.6 m) diameter natural gas pipelines would terminate at the metering station.

Approximately 1.9 miles (3.0 km) of additional pipeline would be installed, using trenching, from the new metering station to MP 1.9 of the proposed Center Road Pipeline along Hueneme Road. Therefore, the total pipeline ROW length would be approximately 3.2 miles (5.1 km).

3.4.3.2 Point Mugu Shore Crossing/Casper Road Pipeline Alternative

The Point Mugu Shore Crossing/Casper Road Pipeline Alternative would cross the Ventura County Naval Base (VCNB Point Mugu) to unincorporated lands in Ventura County. The Navy has agreed to allow this alternative to be investigated, but in no way has it endorsed the Project or guaranteed the final routing of this alternative across Navy property.

This alternative would begin at the same HDD exit points as the proposed Project, at approximately MP 20.5 of the proposed subsea pipelines. It would follow a path at an approximately 75^{o} angle towards shore approximately 1.4 miles (2.2 km) to the HDD entry points on VCNB Point Mugu (see Figures 3.3-1 and 3.4-1). HDD also would be used to transit to a proposed new metering station located approximately 0.8 miles (1.3 km) at the southern end of Casper Road. The two 24-inch (0.6 m) diameter natural gas pipelines would terminate at the metering station. Approximately 1.5 miles (2.4 km) of additional pipeline would be installed from the new metering station to MP 2.4 of the proposed Center Road Pipeline along Hueneme Road. The total pipeline ROW length would be approximately 3.7 miles (5.9 km).

3.4.4 Alternative Onshore Pipeline Routes

The proposed Project has changed in response to public scoping comments. Center Road Pipeline Alternative 1 was formerly proposed by the Applicant and included in the NOI/NOP. The revised proposed Project pipeline route has been relocated to rural areas and an additional rural alternative route has been evaluated (Center Road Pipeline Alternative 2). These two alternative pipeline routes were retained for evaluation in this document and are described below. They represent alternative routes between the Reliant Energy Ormond Beach Generating Station shore crossing and the Center Road Valve Station.

3.4.4.1 Center Road Pipeline Alternative 1

This alternative has been retained because it was the proposed route in the original application. The proposed route has since changed and is described in Section 2,

"Description of the Proposed Action." As depicted in Figure 3.4-1, this alternative would follow existing ROWs and/or public roads as follows:

- This route would begin at the new metering station adjacent to the Reliant Energy Ormond Beach Generating Station shore crossing and then run northeast and north along the SoCalGas ROW and northeast on Pleasant Valley Road and then north on Rice Avenue.
- From Rice Avenue, the new pipeline would proceed west on Gonzales Road, northeast on Rose Avenue, and under U.S. Highway 101.
- From the highway, the route would proceed northeast on Rose Avenue, southeast and northeast on Los Angeles Avenue, north on La Vista Avenue, and west on Center Road to the Center Road Valve Station.

3.4.4.2 Center Road Pipeline Alternative 2

Alternative 2 would follow existing ROWs, public roads, and/or newly acquired easements as described below. This alternative would avoid existing areas of dense residential housing.

- The new pipeline alignment would begin at the new metering station adjacent to the Reliant Energy Ormond Beach Generating Station shore crossing and then run northeast and north along the SoCalGas ROW, east on Hueneme Road, north on Naumann Road, west on Etting Road, north on Hailes Road to Pleasant Valley Road, and north along Wolff Road (see Figure 3.4-1).
- At Wolff Road's intersection with Sturgis Road, the route would continue north through agricultural fields, cross U.S. Highway 101, and proceed northeast through agricultural fields to Central Avenue.
- The route would head northwest at Central Avenue and in alignment with Beardsley Road, cross Beardsley Road and Beardsley Wash, and head northwest along Wright Road to Santa Clara Avenue.
- It would follow Santa Clara Avenue northeast and then continue northeast at Los Angeles Avenue, north at La Vista Avenue, and west at Center Road, where it would terminate at the Center Road Valve Station.

3.4.4.3 Line 225 Pipeline Loop Alternative 1

There is one alternative to the proposed Line 225 Pipeline Loop. This alternative would follow the same route as the proposed route from Quigley Valve Station to MP 4.75, where it would continue northwest on Magic Mountain Parkway. This alternative would veer northwest around MP 5.5, following the SoCalGas ROW and terminating at Honor Rancho Valve Station #9A. It would cross the Santa Clara River at approximately MP 5.7 using an existing pipe bridge. Figure 3.4-2 illustrates the alternative routing for part of the proposed Line 225 Pipeline Loop.

Base map source: *Figure 5.7-2, Transportation for the Line 225 Loop and Alternative Routes,* Entrix, May 3, 2004

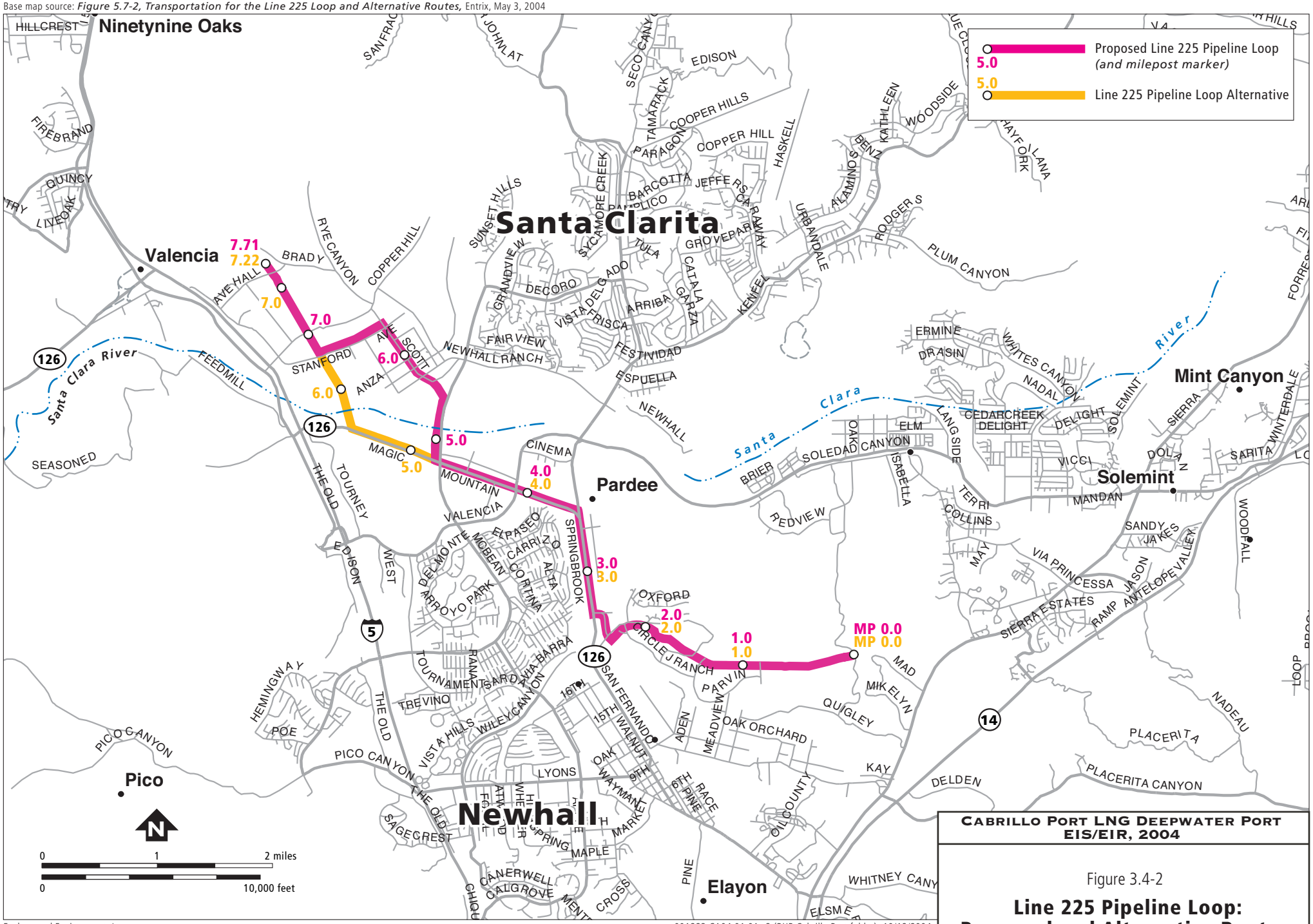

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Figure 3.4-2

Line 225 Pipeline Loop: Proposed and Alternative Routes

3.5 REFERENCES

Ahern, W.R. 1980. "California Meets the LNG Terminal." *Coastal Zone Management Journal,* Vol. 7, No. 2-4, pp 185-221.

Bowdon, Major General W.G. May 2004. Letter to Cy Oggins, California State Lands Commission, concerning an LNG terminal onshore or offshore of Camp Pendleton.

Bremer, Carol. February 20, 2004. "Mexican Regulatory OK Seen for Chevron LNG Plant." Reuters News Service. http://www.planetark.com/dailynewsstory.cfm/newsid/23889/newsDate/20-Feb-2004/story.htm

California Coastal Commission. May 24, 1978. Final Report Evaluating and Ranking LNG Terminal Sites.

_____. September 15, 1978. Offshore LNG Terminal Study.

California Energy Commission. March 2004. Public Interest Energy Research 2003 Annual Report. California Energy Commission. P500-04-010. http://www.energy.ca.gov/reports/2004-04-01_500-04-010.PDF.

City of Oceanside Planning Department. August 15, 2001. Population Growth by City for SCAG Region 050504 and City of Oceanside Demographic Data 050504. http://www.ci.oceanside.ca.us/Planning/oceanside_information.pdf

Federal Energy Regulatory Commission and California State Lands Commission. June 2002. Environmental Impact Statement/Environmental Impact Report, Kern River 2003 Expansion Project, Vols. I and II. FERC/EIS-0144D, Docket No. CP01-422-000; CSLC EIR No. 710; State Clearinghouse No. 2001071035; BLM Reference No. CACA-43346.

Gopal, J., et al. November 21, 2000. California Natural Gas Market and Issues Staff Report. California Energy Commission P200-00-006. http://www.energy.ca.gov/reports/2000-11-22_200-00-006.PDF

_____. August 2003. Natural Gas Market Assessment Staff Report. California Energy Commission. 100-03-006. http://www.energy.ca.gov/reports/2003-08-08_100-03-006.PDF

Kimball, C. March 29, 2004. Counsel for the Archer Trust, comment letter. Docket No. USCG-2004-16877-140. http://dms.dot.gov.

Los Angeles Times. September 3, 2004. "PUC Acts to Boost Natural Gas Supply."

Marks, M., et al. August 2003. Liquid Natural Gas in California: History, Risks, and Siting, Staff White Paper. California Energy Commission (CEC) 700-03-005. http://www.energy.ca.gov/reports/2003-07-17_700-03-005.PDF

National Oceanic and Atmospheric Agency 1983. Channel Islands National Marine Sanctuary Management Plan. http://www.cinms.nos.noaa.gov/marineres/mphome.html.

National Park Service. 2002. Santa Monica Mountains National Recreation Area General Management Plan and Environmental Impact Statement. http://www.nps.gov/samo/supplans/GMPress.htm

_____. 2003. Channel Islands National Park Website. The Park. http://planning.nps.gov/parkweb/purpose.cfm?RecordID=98

Parkhurst, E. December 2002. Natural Gas Supply and Infrastructure Assessment. California Energy Commission (CEC) Staff Paper. 700-02-600F. http://www.energy.ca.gov/reports/2002-12-12_700-02-006F.PDF.

Persily, Larry. 2004. "Baja LNG projects move ahead." *Petroleum News,* Vol. 9, No. 8." http:// www.petroleumnews.com/pnads/309733368.shtml.

Schoch, D. June 15, 2004. Military to Continue Talks on Gas Facility Camp Pendleton commander's opposition to an LNG terminal is overridden. *Los Angeles Times*.

Sempra Energy. December 23, 2003. "Sempra Energy LNG Corp. and Shell Propose to Develop Mexican LNG Receiving Terminal." Distributed by the Prnewswire on behalf of Sempra Energy. http://www.prnewswire.co.uk/cgi/release?id=114424

_____. 2004. "Sempra Energy's proposed LNG terminal in Mexico aims to fill supply gap, hold down prices." http://www.sempra.com/news_spotlight4Q2002.htm.

Staffier, J. March 31, 2004. Counsel for the Bixby Ranch and Counsel for the Hollister Ranch Owner's Association, comment letter. Docket No. USCG-2004-16877-306. http://dms.dot.gov.

State of California Consumer Power and Conservation Financing Authority, Energy Resources Conservation and Development Commission, Public Utilities Commission. 2003. State of California's 2003 Final State of California Energy Action Plan. http://www.energy.ca.gov/energy_action_plan/2003-05-08_ACTION_PLAN.PDF.

United States Coast Guard (USCG). 2003._Environmental Assessment of the El Paso Energy Bridge Gulf of Mexico, L.L.C. Deepwater Port License. U.S. Coast Guard, Vessels and Facilities Operating Standards Division (G-MSO-2), Washington, D.C. Docket No. USCG-2003-14294. http://dms.dot.gov.